SEQUENCE LISTING

<110> BASF Plant Science GmbH

5 <120> METHODS FOR THE PRODUCTION OF STABLY TRANSFORMED, FERTILE GRAMINEAE EMPLOYING AGROBACTERIUM-MEDIATED TRANSFORMATION OF ISOLATED GRAMINEAE ZYGOTES

<130> PF 54757 - AE20030363

10

<160> 3

<170> PatentIn version 3.1

15 ·<210> 1

<211> 12739

<212> DNA

<213> synthetic: expression vector - binary vector pUGAB7

20 <400> 1

tctagaacat ggtggagcac gacactctcg tctactccaa gaatatcaaa gatacagtct 60 cagaagacca gagggctatt gagacttttc aacaaagggt aatatcggga aacctcctcg 120 gattccattg cccagctatc tgtcacttca tcgaaaggac agtagaaaag gaagatggct 180 tctacaaatg ccatcattgc gataaaggaa aggctatcgt tcaagatgcc tctaccgaca 240 25 gtggtcccaa agatggaccc ccacccacga ggaacatcgt ggaaaaagaa gacgttccaa 300 ccacgtcttc aaagcaagtg gattgatgtg atatctccac tgacgtaagg gatgacgcac 360 aatcccacta tccttcgcaa gacccttcct ctatataagg aagttcattt catttggaga 420 ggacctcgag tggccaccat gggcccagaa cgacgccgg ccgacatccg.ccgtgccacc 480 gaggeggaca tgceggeggt etgeaceate gteaaceaet acategagae aageaeggte 540 30 aactteegta cegageegea ggaacegeag gagtggaegg acgaeetegt cegtetgegg 600 gagcgctatc cctggctcgt cgccgaggtg gacggcgagg tcgccggcat cgcctacgcg 660 ggcccctgga aggcacgcaa cgcctacgac tggacggccg agtcgaccgt gtacgtctcc 720 eccegecace ageggaeggg aetgggetee aegetetaca eccaeetget gaagteeetg 780 gaggcacagg gettcaagag cgtggtcgct gtcatcgggc tgcccaacga cccgagcgtg 840 35 cgcatgcacg aggcgctcgg atatgccccc cgcggcatgc tgcgggcggc cggcttcaaq 900 cacgggaact ggcatgacgt gggtttctgg cagctggact tcagcctgcc ggtaccgccc 960 cgtccggtcc tgcccgtcac cgagatctga gatcacgcgt tctagtccgc aaaaatcacc 1020 agtotototo tacaaatota totototota tittitotoca gaataatgig igagtagito 1080 ccagataagg gaattagggt tettataggg tttegeteat gtgttgagea tataagaaac 1140 40 ccttagtatg tatttgtatt tgtaaaatac ttctatcaat aaaatttcta attcctaaaa 1200 ccaaaatcca gtgacctgca ggcatgcaag ctgatccact agaggccatg gcggccgcgt 1260 cgagcgatct agtaacatag atgacaccgc gcgcgataat ttatcctagt ttgcgcgcta 1320 tattttgttt tctatcgcgt attaaatgta taattgcggg actctaatca taaaaaccca 1380 teteataaat aacgteatge attacatgtt aattattaca tgettaacgt aatteaacag 1440 45 aaattatatg ataatcatcg caagaccggc aacaggattc aatcttaaga aactttattg 1500 ccaaatgttt qaacgatcgg ggaaattcga gctcggtagc aattcccgag gctgtagccg 1560 acgatggtgc gccaggagag ttgttgattc attgtttgcc tccctgctgc ggtttttcac 1620 cgaagttcat gccagtccag cgtttttgca gcagaaaagc cgccgacttc ggtttgcggt 1680 cgcgagtgaa gatccctttc ttgttaccgc caacgcgcaa tatgccttgc gaggtcgcaa 1740

			tgttcaccga				1800
			cactgatact				1860
			acgccgtatt				1920
_			ttttccagta				1980
5			cggttcaggc				2040
	cggtgtgagc	gtcgcagaac	attacattga	cgcaggtgat	cggacgcgtc	gggtcgagtt	2100
	tacgcgttgc	ttccgccagt	ggcgcgaaat	attcccgtgc	accttgcgga	cgggtatccg	2160
	gttcgttggc	aatactccac	atcaccacgc	ttgggtggtt	tttgtcacgc	gctatcagct	2220
	ctttaatcgc	ctgtaagtgc	gcttgctgag	tttccccgtt	gactgcctct	tcgctgtaca	2280
10	gttctttcgg	cttgttgccc	gcttcgaaac	caatgcctaa	agagaggtta	aagccgacag	2340
			acgatgccat				2400
			cggtaggagt				2460
			tcgaatcctt				2520
			ggtttgtggt				2580
15			agcgggtaga				2640
			ccttcacccg				2700
			ccagttgcaa				2760
			accacctgcc				2820
			atatcgtcca				2880
20			tagttaaaga				2940
			attcccggcg				3000
			gcacatcaac				3060
			taaactacag				3120
			aatattatat				3180
25			aacttacgta				3240
			tagccgccct				3300
			accgcatcga				3360
			cgctgatacc				3420
			aaactgcctg				3480
30			ccaattccac				3540
			tcacgggttg				3600
			ctgcagaagt				3660
			taaatagcgt				3720
			tccaagtata				3780
35	gtttattata	atagataggt	actcaaggtt	agagcatatg	aatagatgct	gcatatgcca	3840
	tcatgtatat	gcatcagtaa	aacccacatc	aacatgtata	cctatcctag	atcgatcccg	3900
			atcccaggat				3960
	atcagaacgt	gtctgacgta	caggtcgcat	ccgtgtacga	acgctagcag	cacggatcta	4020
	acacaaacac	ggatctaaca	caaacatgaa	cagaagtaga	actaccgggc	cctaaccatg	4080
40	gaccggaacg	ccgatctaga	gaaggtagag	agggggggg	ggggaggacg	agcggcgtac	4140
	cttgaagcgg	aggtgccgac	gggtggattt	gggggagatc	tggttgtgtg	tgtgtgcgct	4200
	ccgaacaaca	cgaggttggg	gaaagagggt	gtggaggggg	tgtctattta	ttacggcggg	4260
	cgaggaaggg	aaagcgaagg	agcggtggga	aaggaatccc	ccgtagctgc	cggtgccgtg	4320
	agaggaggag	gaggccgcct	gccgtgccgg	ctcacgtctg	ccgctccgcc	acgcaatttc	4380
45	tggatgccga	cagcggagca	agtccaacgg	tggagcggaa	ctctcgagag	gggtccagag	4440
	gcagcgacag	agatgccgtg	ccgtctgctt	cgcttggccc	gacgcgacgc	tgctggttcg	4500
			tcgtcgatcg				4560
			cttagttttt				4620
	ttagtcactt	tattttattc	tattttatat	ctaaattatt	aaataaaaaa	actaaaatag	4680

				atagaataaa			4740
				aaatggatgt			4800
				aaggagaaca			4860
-	aactgtagag	tcctgttgtc	aaaatactca	attgtccttt	agaccatgtc	taactgttca	4920
5	tttatatgat	tctctaaaac	actgatatta	ttgtagtact	atagattata	ttattcgtag	4980
	agtaaagttt	aaatatatgt	ataaagatag	ataaactgca	cttcaaacaa	gtgtgacaaa	5040
	aaaaatatgt	ggtaatttt	tataacttag	acatgcaatg	ctcattatct	ctagagaggg	5100
	gcacgaccgg	gtcacgctgc	actgcagcct	agtaaggcct	taagggccag	atcttgggcc	5160
				ttcggtttaa			5220
10	tatattggcg	ggtaaaccta	agagaaaaga	gcgtttatta	gaataatcgg	atatttaaaa	5280
	gggcgtgaaa	aggtttatcc	gttcgtccat	ttgtatgtgc	atgccaacca	cagggttccc	5340
	ctcgggagtg	cttggcattc	cgtgcgataa	tgacttctgt	tcaaccaccc	aaacgtcgga	5400
	aagcctgacg	acggagcagc	attccaaaaa	gatcccttgg	ctcgtctggg	tcggctagaa	5460
	ggtcgagtgg	gctgctgtgg	cttgatccct	caacgcggtc	gcggacgtag	cgcagcgccg	5520
15	aaaaatcctc	gatcgcaaat	ccgacgctgt	cgaaaagcgt	gatctgcttg	tegetette	5580
	ggccgacgtc	ctggccagtc	atcacgcgcc	aaagttccgt	cacaggatga	tctggcgcga	5640
				gtggcgggaa			5700
				tgcctgggca			5760
	tgtggacgcc	gaaaaggatc	taggtgaaga	tcctttttga	taatctcatg	accaaaatcc	5820
20	cttaacgtga	gttttcgttc	cactgagcgt	cagaccccgt	agaaaagatc	aaaggatctt	5880
				gctgcttgca			5940
				taccaactct			6000
	tcagcagagc	gcagatacca	aatactgttc	ttctagtgta	gccgtagtta	ggccaccact	6060
	tcaagaactc	tgtagcaccg	cctacatacc	tegetetget	aatcctgtta	ccagtggctg	6120
25	ctgccagtgg	cgataagtcg	tgtcttaccg	ggttggactc	aagacgatag	ttaccggata	6180
	aggcgcagcg	gtcgggctga	acggggggtt	cgtgcacaca	gcccagcttg	gagcgaacga	6240
	cctacaccga	actgagatac	ctacagcgtg	agctatgaga	aagcgccacg	cttcccgaag	6300
	ggagaaaggc	ggacaggtat	ccggtaagcg	gcagggtcgg	aacaggagag	cgcacgaggg	6360
	agcttccagg	gggaaacgcc	tggtatcttt	atagtcctgt	cgggtttcgc	cacctctgac	6420
30	ttgagcgtcg	atttttgtga	tgctcgtcag	gggggcggag	cctatggaaa	aacgccagca	6480
	acgcggcctt	tttacggttc	ctggcctttt	gctggccttt	tgctcacatg	ttctttcctg	6540
				taccgccttt			6600
	ccgcagccga	acgaccgagc	gcagcgagtc	agtgagcgag	gaagcggaag	agcgcctgat	6660
	gcggtatttt	ctccttacgc	atctgtgcgg	tatttcacac	cgcatatggt	gcactctcag	6720
35	tacaatctgc	tctgatgccg	catagttaag	ccagtataca	ctccgctatc	gctacgtgac	6780
	tgggtcatgg	ctgcgccccg	acacccgcca	acacccgctg	acgcgccctg	acgggcttgt	6840
				gtgaccgtct			6900
-				aggcaggggt			6960
	cctccgctgc	tatagtgcag	teggettetg	acgttcagtg	cagccgtctt	ctgaaaacga	7020
40	catgtcgcac	aagtcctaag	ttacgcgaca	ggctgccgcc	ctgccctttt	cctggcgttt	7080
	tcttgtcgcg	tgttttagtc	gcataaagta	gaatacttgc	gactagaacc	ggagacatta	7140
				gctgggctat			7200
				gcacgcggcc			7260
45				cccggagctg			7320
45				gctagaccgc			7380
				ggccggcgcg			7440
				ccgcatggtg			7500
				ccgcacccgg			7560
	ggcgcgaggc	gtgaagtttg	gccccgccc	taccctcacc	ccggcacaga	tcgcgcacgc	7620

				•			
	ccgcgagctg	atcgaccagg	aaggccgcac	cgtgaaagag	gcggctgcac	tgcttggcgt	7680
						ccaccgagge	7740
	caggcggcgc	ggtgccttcc	gtgaggacgc	attgaccgag	gccgacgccc	tggcggccgc	7800
	cgagaatgaa	cgccaagagg	aacaagcatg	aaaccgcacc	aggacggcca	ggacgaaccg	7860
5					ccgggtacgt		7920
	cccgcgcacg	tctcaaccgt	gcggctgcat	gaaatcctgg	ccggtttgtc	tgatgccaag	7980
					agcgccgccg		8040
					ctgcgtatat		8100
					cgctgtactt		8160
10					cgccctgcaa		8220
					ccgcgattgg		8280
					gacgattgac		. 8340
					gccccaggcg		8400
	ctgtgtccgc	gatcaaggca	gccgacttcg	tgctgattcc	ggtgcagcca	agcccttacg	8460
15					gcgcattgag		8520
					aggcacgcgc		8580
					tgagtcccgt		8640
					tcttgaatca		8700
					taaatcaaaa		8760
20					ctaagtgccg		8820
					gacacgccag		8880
					aagatgtacg		8940
					cagctaccag		9000
					aggcggcatg		9060
25	aacaaccagg	caccgacgcc	gtggaatgcc	ccatgtgtgg	aggaacgggc	ggttggccag	9120
	gcgtaagcgg	ctgggttgtc	tgccggccct	gcaatggcac	tggaaccccc	aagcccgagg	9180
					atcggcgcgg		9240
					cggcaacgca		9300
					atccgcaaag		9360
30					aagggcgacg		9420
	ttttttcgtt	ccgatgctct	atgacgtggg	cacccgcgat	agtcgcagca	tcatggacgt	9480
					gaggtgatcc		9540
	tccagacggg	cacgtagagg	tttccgcagg	gccggccggc	atggcgagtg	tgtgggatta	9600
	cgacctggta	ctgatggcgg	tttcccatct	aaccgaatcc	atgaaccgat	accgggaagg	9660
35	gaagggagac	aagcccggcc	gcgtgttccg	tccacacgtt	gcggacgtac	tcaagttctg	9720
	ccggcgagcc	gatggcggaa	agcagaaaga	cgacctggta	gaaacctgca	ttcggttaaa	9780
					aacggccgcc		9840
					aagagcgaaa		9900
4.0					gagatcacag		9960
40					gatcccggca		10020
					gccagatggt		10080
					ttctgtttca		10140
					gaggaggcgg		10200
4-	cccgatccta	gtcatgcgct	accgcaacct	gatcgagggc	gaagcatccg	ccggttccta	10260
45	atgtacggag	cagatgctag	ggcaaattgc	cctagcaggg	gaaaaaggtc	gaaaaggtct	10320
	ctttcctgtg	gatagcacgt	acattgggaa	cccaaagccg	tacattggga	accggaaccc	10380
	gtacattggg	aacccaaagc	cgtacattgg	gaaccggtca	cacatgtaag	tgactgatat	10440
	aaaagagaaa	aaaggcgatt	tttccgccta	aaactcttta	aaacttatta	aaactcttaa	10500
	aacccgcctg	gcctgtgcat	aactgtctgg	ccagcgcaca	gccgaagagc	tgcaaaaagc	10560

gectaecett eggtegetge geteectaeg eecegeeget tegegtegge etategegge 10620 cgctggccgc tcaaaaatgg ctggcctacg gccaggcaat ctaccagggc gcggacaagc 10680 egegeegteg ceactegace geeggegeee acateaagge aceggtgggt atgeetgacg 10740 atgcgtggag accgaaacct tgcgctcgtt cgccagccag gacagaaatg cctcgacttc 10800 5 gctgctgccc aaggttgccg ggtgacgcac accgtggaaa cggatgaagg cacgaaccca 10860 gtggacataa gcctgttcgg ttcgtaagct gtaatgcaag tagcgtatgc gctcacgcaa 10920 ctggtccaga accttgaccg aacgcagcgg tggtaacggc gcagtggcgg ttttcatggc 10980 ttgttatgac tgtttttttg gggtacagtc tatgcctcgg gcatccaagc agcaagcgcg 11040 ttacgccgtg ggtcgatgtt tgatgttatg gagcagcaac gatgttacgc agcagggcag 11100 10 tegecetaaa acaaagttaa acateatgag ggaageggtg ategeegaag tategaetea 11160 actatcagag gtagttggcg tcatcgagcg ccatctcgaa ccgacgttgc tggccgtaca 11220 tttgtacggc tccgcagtgg atggcggcct gaagccacac agtgatattg atttgctggt 11280 tacggtgacc gtaaggcttg atgaaacaac gcggcgagct ttgatcaacg accttttgga 11340 aacttegget teccetggag agagegagat teteegeget gtagaagtea ceattgttgt 11400 15 gcacgacgac atcattccgt ggcgttatcc agctaagcgc gaactgcaat ttggagaatg 11460 gcagcgcaat gacattettg caggtatett cgagccagec acgategaca ttgatetgge 11520 tatcttgctg acaaaagcaa gagaacatag cgttgccttg gtaggtccag cggcggagga 11580 actetttgat eeggtteetg aacaggatet atttgaggeg etaaatgaaa eettaaeget 11640 atggaactcg ccgcccgact gggctggcga tgagcgaaat gtagtgctta cgttgtcccg 11700 20 catttggtac agcgcagtaa ccggcaaaat cgcgccgaag gatgtcgctg ccgactgggc 11760 aatggagege etgeeggeee agtateagee egteataett gaagetagae aggettatet 11820 tggacaagaa gaagatcgct tggcctcgcg cgcagatcag ttggaagaat ttgtccacta 11880 cgtgaaaggc gagatcacca aggtagtcgg caaataatgt ctaacaattc gttcaagccg 11940 acgccgcttc gcggcgcgc ttaactcaag cgttagatgc actaagcaca taattgctca 12000 25 cagccaaact atcaggtcaa gtctgctttt attattttta agcgtgcata ataagcccta 12060 cacaaattgg gagatatatc atgaaaggct ggctttttct tgttatcgca atagttggcg 12120 aagtaatege aacatagett gettggtegt teegegtgaa egteggeteg attgtaeetg 12180 cgttcaaata ctttgcgatc gtgttgcgcg cctgcccggt gcgtcggctg atctcacgga 12240 tegaetgett etetegeaac gecateegae ggatgatgtt taaaagteec atgtggatea 12300 30 ctccgttgcc ccgtcgctca ccgtgttggg gggaaggtgc acatggctca gttctcaatg 12360 gaaattatct gcctaaccgg ctcagttctg cgtagaaacc aacatgcaag ctccaccggg 12420 tgcaaagcgg cagcggcggc aggatatatt caattgtaaa tggcttcatg tccgggaaat 12480 ctacatggat cagcaatgag tatgatggtc aatatggaga aaaagaaaga gtaattacca 12540 atttttttc aattcaaaaa tgtagatgtc cgcagcgtta ttataaaatg aaagtacatt 12600 35 ttgataaaac gacaaattac gatccgtcgt atttataggc gaaagcaata aacaaattat 12660 tctaattcgg aaatctttat ttcgacgtgt ctacattcac gtccaaatgg gggcttagat 12720 gagaaacttc acgatcggc 12739 <210> 2 40 <211> 11195 <212> synthetic: expression vector - binary vector pSUNUbi-GFP <213> 45 <400> aatattcaaa caaacacata cagcgcgact tatcatggac atacaaatgg acgaacggat 60 aaaccttttc acgccctttt aaatatccga ttattctaat aaacgctctt ttctcttagg 120 tttacccgcc aatatatcct gtcaaacact gatagtttaa actgaaggcg ggaaacgaca 180

atcagatcta gtaggaaaca gctatgacca tgattacgcc aagctggccg cgtcgagcga

240

tctagtaaca tagatgacac cgcgcgcgat aatttatcct agtttgcgcg ctatattttg 300 ttttctatcg cgtattaaat gtataattgc gggactctaa tcataaaaac ccatctcata 360 aataacgtca tgcattacat gttaattatt acatgcttaa cgtaattcaa cagaaattat 420 atgataatca tcgcaagacc ggcaacagga ttcaatctta agaaacttta ttgccaaatg 480 tttgaacgat cggggaaatt cgagtcgact ctagaggatc cccggccgcc ccgactctag 540 tegagttact tgtacagete gtecatgeeg agagtgatee eggeggeggt caegaactee 600 agcaggacca tgtgatcgcg cttctcgttg gggtctttgc tcagggcgga ctgggtgctc 660 aggtagtggt tgtcgggcag cagcacgggg ccgtcgccga tgggggtgtt ctgctggtag 720 tggtcggcga gctgcacgct gccgtcctcg atgttgtggc gggtcttgaa gttcaccttg 780 10 atgccgttct tetgettgte ggeggtgata tagacettgt ggetgttgta gttgtactee 840 agettgtgcc ccaggatgtt gccgtcctcc ttgaagtcga tgcccttcag ctcgatgcgg 900 ttcaccaggg tgtcgccctc gaacttcacc tcggcgcggg tcttgtagtt gccgtcgtcc 960 ttgaagaaga tggtgcgctc ctggacgtag ccttcgggca tggcggactt gaagaagtcg 1020 tgctgcttca tgtggtcggg gtagcgggcg aagcactgca cgccgtaggt caaggtggtc 1080 15 acgagggtgg gccaggcac gggcagcttg ccggtggtgc agatgaactt cagggtcagc 1140 ttgccgtagg tggcatcgcc ctcgccctcg ccggacacgc tgaacttgtg gccgtttacg 1200 tegeegteca getegaceag gatgggeace acceeggtga acageteete gecettgete 1260 accatggtgg ctttaccaac agtaccggaa tgccaagctt acttagatcg cagatctact 1320 agtatgatgg gtacccgggg gatccgatat cgcccgggct gcagaagtaa caccaaacaa 1380 20 cagggtgagc atcgacaaaa gaaacagtac caagcaaata aatagcgtat gaaggcaggg 1440 ctaaaaaaat ccacatatag ctgctgcata tgccatcatc caagtatatc aagatcaaaa 1500 taattataaa acatacttgt ttattataat agataggtac tcaaggttag agcatatgaa 1560 tagatgctgc atatgccatc atgtatatgc atcagtaaaa cccacatcaa catgtatacc 1620 tatcctagat cgatatttcc atccatctta aactcgtaac tatgaagatg tatgacacac 1680 25 acatacagtt ccaaaattaa taaatacacc aggtagtttg aaacagtatt ctactccgat 1740 ctagaacgaa tgaacgaccg cccaaccaca ccacatcatc acaaccaagc gaacaaaaag 1800 catctctgta tatgcatcag taaaacccgc atcaacatgt atacctatcc tagatcgata 1860 tttccatcca tcatcttcaa ttcgtaacta tgaatatgta tggcacacac atacagatcc 1920 aaaattaata aatccaccag gtagtttgaa acagaattct actccgatct agaacgaccg 1980 30 cccaaccaga ccacatcatc acaaccaaga caaaaaaaag catgaaaaga tgacccgaca 2040 aacaagtgca cggcatatat tgaaataaag gaaaagggca aaccaaaccc tatgcaacga 2100 aacaaaaaaa atcatgaaat cgatcccgtc tgcggaacgg ctagagccat cccaggattc 2160 cccaaagaga aacactggca agttagcaat cagaacgtgt ctgacgtaca ggtcgcatcc 2220 gtgtacgaac gctagcagca cggatctaac acaaacacgg atctaacaca aacatgaaca 2280 35 gaagtagaac taccgggccc taaccatgga ccggaacgcc gatctagaga aggtagagag 2340 999999999 ggaggacgag cggcgtacct tgaagcggag gtgccgacgg gtggatttgg 2400 gggagatctg gttgtgtgtg tgtgcgctcc gaacaacacg aggttgggga aagagggtgt 2460 ggaggggtg tctatttatt acggcgggcg aggaagggaa agcgaaggag cggtgggaaa 2520 ggaatecece gtagetgeeg tgeegtgaga ggaggaggag geegeetgee gtgeeggete 2580 40 acgtctgccg ctccgccacg caatttctgg atgccgacag cggagcaagt ccaacggtgg 2640 ageggaacte tegagagggg tecagaggea gegacagaga tgeegtgeeg tetgettege 2700 ttggcccgac gcgacgctgc tggttcgctg gttggtgtcc gttagactcg tcgacggcgt 2760 ttaacaggct ggcattatct actcgaaaca agaaaaatgt ttccttagtt tttttaattt 2820 cttaaagggt atttgtttaa tttttagtca ctttatttta ttctatttta tatctaaatt 2880 45 attaaataaa aaaactaaaa tagagtttta gttttcttaa tttagaggct aaaatagaat 2940 aaaatagatg tactaaaaaa attagtctat aaaaaccatt aaccctaaac cctaaatgga 3000 tgtactaata aaatggatga agtattatat aggtgaagct atttgcaaaa aaaaaggaga 3060 acacatgcac actaaaaaga taaaactgta gagtcctgtt gtcaaaatac tcaattgtcc 3120 tttagaccat gtctaactgt tcatttatat gattctctaa aacactgata ttattgtagt 3180

actatagatt atattattcg tagagtaaag tttaaatata tgtataaaga tagataaact 3240 gcacttcaaa caagtgtgac aaaaaaaata tgtggtaatt ttttataact tagacatgca 3300 atgeteatta tetetagaga ggggeaegae egggteaege tgeaetgeag gaattegatg 3360 ggctcgaggt accgagctcg gtacccactg gattttggtt ttaggaatta gaaattttat 3420 5 tgatagaagt attttacaaa tacaaataca tactaagggt ttcttatatg ctcaacacat 3480 gagcgaaacc ctataagaac cctaattccc ttatctggga actactcaca cattattata 3540 gagagagata gatttgtaga gagagactgg tgatttcagc ggcatgcctg caggtcgact 3600 cagatetggg taactggcct aactggcctt ggaggagctg gcaactcaaa atccctttgc 3660 caaaaaccaa catcatgcca tccaccatgc ttgtatccag ctgcgcgcaa tgtacccgg 3720 10 gctgtgtatc ccaaagcctc atgcaaccta acagatggat cgtttggaag gcctataaca 3780 gcaaccacag acttaaaacc ttgcgcctcc atagacttaa gcaaatgtgt gtacaatgtg 3840 gatcctaggc ccaacctttg atgcctatgt gacacgtaaa cagtactctc aactgtccaa 3900 tegtaagegt teetageett eeagggeeea gegtaageaa taccageeac aacaceetea 3960 acctcagcaa ccaaccaagg gtatctatct tgcaacctct ctagatcatc aatccactct 4020 15 tgtggtgttt gtggctctgt cctaaagttc actgtagacg tctcaatgta atggttaacg 4080 atatcacaaa ccgcggccat atcagctgct gtagctggcc taatctcaac tggtctcctc 4140 tccggagaca tgtcgactct agaggatccc ccgggctgca gaagtaacac caaacaacag 4200 ggtgagcatc gacaaaagaa acagtaccaa gcaaataaat agcgtatgaa ggcagggcta 4260 aaaaaatcca catatagctg ctgcatatgc catcatccaa gtatatcaag atcaaaataa 4320 20 ttataaaaca tacttgttta ttataataga taggtactca aggttagagc atatgaatag 4380 atgctgcata tgccatcatg tatatgcatc agtaaaaccc acatcaacat gtatacctat 4440 cctagatcga tatttccatc catcttaaac tcgtaactat gaagatgtat gacacacaca 4500 tacagttcca aaattaataa atacaccagg tagtttgaaa cagtattcta ctccgatcta 4560 gaacgaatga acgaccgccc aaccacacca catcatcaca accaagcgaa caaaaagcat 4620 25 ctctgtatat gcatcagtaa aacccgcatc aacatgtata cctatcctag atcgatattt 4680 ccatccatca tetteaatte gtaactatga atatgtatgg cacacacata cagatecaaa 4740 attaataaat ccaccaggta gtttgaaaca gaattctact ccgatctaga acgaccgccc 4800 aaccagacca catcatcaca accaagacaa aaaaaagcat gaaaagatga cccgacaaac 4860 aagtgcacgg catatattga aataaaggaa aagggcaaac caaaccctat gcaacgaaac 4920 30 aaaaaaaatc atgaaatcga tcccgtctgc ggaacggcta gagccatccc aggattcccc 4980 aaagagaaac actggcaagt tagcaatcag aacgtgtctg acgtacaggt cgcatccgtg 5040 tacgaacgct agcagcacgg atctaacaca aacacggatc taacacaaac atgaacagaa 5100 gtagaactac cgggccctaa ccatggaccg gaacgccgat ctagagaggg tagagagggg 5160 gggggggga ggacgagcgg cgtaccttga agcggaggtg ccgacgggtg gatttggggg 5220 35 agatetggtt gtgtgtgt gegeteegaa caacacgagg ttggggaaag agggtgtgga 5280 gggggtgtct atttattacg gcgggcgagg aagggaaagc gaaggagcgg tgggaaagga 5340 atcccccgta gctgccgtgc cgtgagagga ggaggaggcc gcctgccgtg ccggctcacg 5400 tetgeegete egecaegeaa tttetggatg eegacagegg ageaagteea aeggtggage 5460 ggaacteteg agaggggtee agaggeageg acagagatge egtgeegtet gettegettg 5520 40 gcccgacgcg acgctgctgg ttcgctggtt ggtgtccgtt agactcgtcg acggcgttta 5580 acaggetgge attatetact egaaacaaga aaaatgttte ettagtttt ttaatttett 5640 aaagggtatt tgtttaattt ttagtcactt tattttattc tattttatat ctaaattatt 5700 aaataaaaaa actaaaatag agttttagtt ttcttaattt agaggctaaa atagaataaa 5760 atagatgtac taaaaaaatt agtctataaa aaccattaac cctaaaccct aaatggatgt 5820 45 actaataaaa tggatgaagt attatatagg tgaagctatt tgcaaaaaaa aaggagaaca 5880 catgcacact aaaaagataa aactgtagag tcctgttgtc aaaatactca attgtccttt 5940 agaccatgtc taactgttca tttatatgat tctctaaaac actgatatta ttgtagtact 6000 atagattata ttattcgtag agtaaagttt aaatatatgt ataaagatag ataaactgca 6060 cttcaaacaa gtgtgacaaa aaaaatatgt ggtaattttt tataacttag acatgcaatg 6120

ctcattatct ctagagaggg gcacgaccgg gtcacgctgc actgcaggaa ttcgatatca 6180 agctggctga gtggctcctt caacgttgcg gttctgtcag ttccaaacgt aaaacggctt 6240 gtcccgcgtc atcggcgggg gtcataacgt gactccctta attctccgct catgatcaga 6300 ttgtcgtttc ccgccttcag tttaaactat cagtgtttga caggatcact gcttggtaat 6360 5 aattgtcatt agattgtttt tatgcataga tgcactcgaa atcagccaat tttagacaag 6420 tatcaaacgg atgttaattc agtacattaa agacgtccgc aatgtgttat taagttgtct 6480 aagcgtcaat ttgtttacac cacaatatat cctgccacca gccagccaac agctccccga 6540 ccggcagctc ggcacaaaat caccacgcgt ctaaaaaggt gatgtgtatt tgagtaaaac 6600 agettgegte atgeggtege tgegtatatg atgegatgag taaataaaca aatacgeaag 6660 10 gggaacgcat gaaggttatc gctgtactta accagaaagg cgggtcaggc aagacgacca 6720 tegeaaceca tetagecege gecetgeaac tegeegggge egatgttetg ttagtegatt 6780 ccgatcccca gggcagtgcc cgcgattggg cggccgtgcg ggaagatcaa ccgctaaccg 6840 ttgtcggcat cgaccgcccg acgattgacc gcgacgtgaa ggccatcggc cggcgcgact 6900 tegtagtgat egaeggageg ecceaggegg eggaettgge tgtgteegeg atcaaggeag 6960 15 ccgacttcgt gctgattccg gtgcagccaa gcccttacga catatgggcc accgccgacc 7020 tggtggagct ggttaagcag cgcattgagg tcacggatgg aaggctacaa gcggcctttg 7080 tegtgtegeg ggegateaaa ggeaegegea teggeggtga ggttgeegag gegetggeeg 7140 ggtacgaget geceattett gagteeegta teaegeageg egtgagetae ceaggeaetg 7200 ccgccgccgg cacaaccgtt cttgaatcag aacccgaggg cgacgctgcc cgcgaggtcc 7260 20 aggcgctggc cgctgaaatt aaatcaaaac tcatttgagt taatgaggta aagagaaaat 7320 gagcaaaagc acaaacacgc taagtgccgg ccgtccgagc gcacgcagca gcaaggctgc 7380 aacgttggcc agcctggcag acacgccagc catgaagcgg gtcaactttc agttgccggc 7440 ggaggatcac accaagctga agatgtacgc ggtacgccaa ggcaagacca ttaccgagct 7500 gctatctgaa tacatcgcgc agctaccaga gtaaatgagc aaatgaataa atgagtagat 7560 25 gaattttagc ggctaaagga ggcggcatgg aaaatcaaga acaaccaggc accgacgccg 7620 tggaatgccc catgtgtgga ggaacgggcg gttggccagg cgtaagcggc tgggttgtct 7680 gccggccctg caatggcact ggaaccccca agcccgagga atcggcgtga gcggtcgcaa 7740 accatccggc ccggtacaaa tcggcgcggc gctgggtgat gacctggtgg agaagttgaa 7800 ggccgcgcag gccgcccagc ggcaacgcat cgaggcagaa gacgccccgg tgaatcgtgg 7860 30 caaggggccg ctgatcgaat ccgcaaagaa tcccggcaac cgccggcagc cggtgcgccg 7920 tcgattagga agccgcccaa gggcgacgag caaccagatt ttttcgttcc gatgctctat 7980 gacgtgggca cccgcgatag tcgcagcatc atggacgtgg ccgttttccg tctgtcgaag 8040 cgtgaccgac gagctggcga ggtgatccgc tacgagcttc cagacgggca cgtagaggtt 8100 tecgeaggge eggeeggeat ggeeagtgtg tgggattacg acetggtact gatggeggtt 8160 35 teccatetaa eegaateeat gaacegatae egggaaggga agggagacaa geeeggeege 8220 gtgttccgtc cacacgttgc ggacgtactc aagttctgcc ggcgagccga tggcggaaag 8280 cagaaagacg acctggtaga aacctgcatt cggttaaaca ccacgcacgt tgccatgcag 8340 cgtacgaaga aggccaagaa cggccgcctg gtgacggtat ccgagggtga agccttgatt 8400 agecgetaca agategtaaa gagegaaace gggeggeegg agtacatega gategageta 8460 40 gctgattgga tgtaccgcga gatcacagaa ggcaagaacc cggacgtgct gacggttcac 8520 cccgattact ttttgatcga tcccggcatc ggccgttttc tctaccgcct ggcacgccgc 8580 gccgcaggca aggcagaagc cagatggttg ttcaagacga tctacgaacg cagtggcagc 8640 gccggagagt tcaagaagtt ctgtttcacc gtgcgcaagc tgatcgggtc aaatgacctg 8700 ccggagtacg atttgaagga ggaggcgggg caggctggcc cgatcctagt catgcgctac 8760 45 cgcaacctga tcgagggcga agcatccgcc ggttcctaat gtacggagca gatgctaggg 8820 caaattgccc tagcagggga aaaaggtcga aaaggtctct ttcctgtgga tagcacgtac 8880 attgggaacc caaagccgta cattgggaac cggaacccgt acattgggaa cccaaagccg 8940 tacattggga accggtcaca catgtaagtg actgatataa aagagaaaaa aggcgatttt 9000 tccgcctaaa actctttaaa acttattaaa actcttaaaa cccgcctggc ctgtgcataa 9060

ctgtctggcc agcgcacagc cgaagagctg caaaaagcgc ctacccttcg gtcgctgcgc 9120 tecetaegee eegeegette gegteggeet ategeggeet atgeggtgtg aaataeegea 9180 cagatgcgta aggagaaaat accgcatcag gcgctcttcc gcttcctcgc tcactgactc 9240 gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 9300 gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 9360 ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 9420 cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 9480 ataccaggeg tttecceetg gaageteect egtgegetet eetgtteega eeetgeeget 9540 taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 9600 10 ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 9660 ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 9720 aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 9780 tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaaggac 9840 agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 9900 15 ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 9960 tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 10020 tcagtggaac gaaaactcac gttaagggat tttggtcatg catgatatat ctcccaattt 10080 gtgtagggct tattatgcac gcttaaaaat aataaaagca gacttgacct gatagtttgg 10140 ctgtgagcaa ttatgtgctt agtgcatcta acgcttgagt taagccgcgc cgcgaagcgg 10200 20 cgtcggcttg aacgaatttc tagctagaca ttatttgccg actaccttgg tgatctcgcc 10260 tttcacgtag tggacaaatt cttccaactg atctgcgcgc gaggccaagc gatcttcttc 10320 ttgtccaaga taagcctgtc tagcttcaag tatgacgggc tgatactggg ccggcaggcg 10380 ctccattgcc cagtcggcag cgacatcctt cggcgcgatt ttgccggtta ctgcgctgta 10440 ccaaatgcgg gacaacgtaa gcactacatt tcgctcatcg ccagcccagt cgggcggcga 10500 25 gttccatagc gttaaggttt catttagcgc ctcaaataga tcctgttcag gaaccggatc 10560 aaagagttcc teegeegetg gacetaceaa ggcaaegeta tgttetettg ettttgteag 10620 caagatagcc agatcaatgt cgatcgtggc tggctcgaag atacctgcaa gaatgtcatt 10680 gcgctgccat tctccaaatt gcagttcgcg cttagctgga taacgccacg gaatgatgtc 10740 gtcgtgcaca acaatggtga cttctacagc gcggagaatc tcgctctctc caggggaagc 10800 30 cgaagtttcc aaaaggtcgt tgatcaaagc tcgccgcgtt gtttcatcaa gccttacggt 10860 caccgtaacc agcaaatcaa tatcactgtg tggcttcagg ccgccatcca ctgcggagcc 10920 gtacaaatgt acggccagca acgtcggttc gagatggcgc tcgatgacgc caactacctc 10980 tgatagttga gtcgatactt cggcgatcac cgcttccccc atgatgttta actttgtttt 11040 agggcgactg ccctgctgcg taacatcgtt gctgctccat aacatcaaac atcgacccac 11100 35 ggcgtaacgc gcttgctgct tggatgcccg aggcatagac tgtaccccaa aaaaacagtc 11160 ataacaagcc atgaaaaccg ccactgcgtt ccatg 11195 <210> 3 40 <211> 12415 <212> DNA <213> synthetic: expression vector - binary vector psunubigus <400> 3 45 aatattcaaa caaacacata cagcgcgact tatcatggac atacaaatgg acgaacggat 60 aaaccttttc acgccctttt aaatatccga ttattctaat aaacgctctt ttctcttagg 120 tttacccgcc aatatatcct gtcaaacact gatagtttaa actgaaggcg ggaaacgaca 180 atcagatcta gtaggaaaca gctatgacca tgattacgcc aagcttgcat gcctgcaggt

cgaaattcga gctcggtacc cggtcactgg attttggttt taggaattag aaattttatt

240

300

gatagaagta ttttacaaat acaaatacat actaagggtt tcttatatgc tcaacacatg 360 agcgaaaccc tataagaacc ctaattccct tatctgggaa ctactcacac attattctgg 420 agaaaaatag agagagatag atttgtagag agagactggt gatttttgcg ccgggtaccg 480 agctcggtag caattcccga ggctgtagcc gacgatggtg cgccaggaga gttgttgatt 540 5 cattgtttgc ctccctgctg cggtttttca ccgaagttca tgccagtcca gcgtttttgc 600 agcagaaaag ccgccgactt cggtttgcgg tcgcgagtga agatcccttt cttgttaccg 660 ccaacgcgca atatgccttg cgaggtcgca aaatcggcga aattccatac ctgttcaccg 720 acgacggcgc tgacgcgatc aaagacgcgg tgatacatat ccagccatgc acactgatac 780 tetteactee acatgteggt gtacattgag tgcageegg ctaacgtate caegeegtat 840 10 teggtgatga taateggetg atgeagttte teetgeeagg ceagaagtte ttttteeagt 900 accttetetg cegittecaa ategeegett tggacatace ateegtaata aeggiteagg 960 cacagcacat caaagagatc gctgatggta tcggtgtgag cgtcgcagaa cattacattg 1020 acgcaggtga teggaegegt egggtegagt ttaegegttg etteegeeag tggegaaata 1080 ttcccgtgca cttgcggacg ggtatccggt tcgttggcaa tactccacat caccacgctt 1140 15 gggtggtttt tgtcacgcgc tatcagctct ttaatcgcct gtaagtgcgc ttgctgagtt 1200 tccccgttga ctgcctcttc gctgtacagt tctttcggct tgttgcccgc ttcgaaacca 1260 atgcctaaag agaggttaaa gccgacagca gcagtttcat caatcaccac gatgccatgt 1320 tcatctgccc agtcgagcat ctcttcagcg taagggtaat gcgaggtacg gtaggagttg 1380 gccccaatcc agtccattaa tgcgtggtcg tgcaccatca gcacgttatc gaatcctttg 1440 20 ccacgtaagt ccgcatcttc atgacgacca aagccagtaa agtagaacgg tttgtggtta 1500 atcaggaact gttcgccctt cactgccact gaccggatgc cgacgcgaag cgggtagata 1560 tcacactctg tctggctttt ggctgtgacg cacagttcat agagataacc ttcacccggt 1620 tgccagaggt gcggattcac cacttgcaaa gtcccgctag tgccttgtcc agttgcaacc 1680 acctgttgat ccgcatcacg cagttcaacg ctgacatcac cattggccac cacctgccag 1740 25 tcaacagacg cgtggttaca gtcttgcgcg acatgcgtca ccacggtgat atcgtccacc 1800 caggtgttcg gcgtggtgta gagcattacg ctgcgatgga ttccggcata gttaaagaaa 1860 tcatggaagt aagactgctt tttcttgccg ttttcgtcgg taatcaccat tcccggcggg 1920 atagtctgcc agttcagttc gttgttcaca caaacggtga tacctgcaca tcaacaaatt 1980 ttggtcatat attagaaaag ttataaatta aaatatacac acttataaac tacagaaaag 2040 30 caattgctat atactacatt cttttatttt gaaaaaaata tttgaaatat tatattacta 2100 ctaattaatg ataattatta tatatatatc aaaggtagaa gcagaaactt acgtacactt 2160 ttcccggcaa taacatacgg cgtgacatcg gcttcaaatg gcgtatagcc gccctgatgc 2220 tccatcactt cctgattatt gacccacact ttgccgtaat gagtgaccgc atcgaaacgc 2280 agcacgatac gctggcctgc ccaacctttc ggtataaaga cttcgcgctg ataccagacg 2340 35 ttgcccgcat aattacgaat atctgcatcg gcgaactgat cgttaaaact gcctggcaca 2400 gcaattgccc ggctttcttg taacgcgctt tcccaccaac gctgaccaat tccacagttt 2460 tegegateca gaetgaatge ceacaggeeg tegagttttt tgattteacg ggttggggtt 2520 tctacaggac gtaccatggt cgatcgactc tagactagtg gatccgatat cgcccgggct 2580 gcagaagtaa caccaaacaa cagggtgagc atcgacaaaa gaaacagtac caagcaaata 2640 40 aatagcgtat gaaggcaggg ctaaaaaaat ccacatatag ctgctgcata tgccatcatc 2700 caagtatatc aagatcaaaa taattataaa acatacttgt ttattataat agataggtac 2760 tcaaggttag agcatatgaa tagatgctgc atatgccatc atgtatatgc atcagtaaaa 2820 cccacatcaa catgtatacc tatcctagat cgatatttcc atccatctta aactcgtaac 2880 tatgaagatg tatgacacac acatacagtt ccaaaattaa taaatacacc aggtagtttg 2940 45 aaacagtatt ctactccgat ctagaacgaa tgaacgaccg cccaaccaca ccacatcatc 3000 acaaccaagc gaacaaaaag catctctgta tatgcatcag taaaacccgc atcaacatgt 3060 atacctatcc tagatcgata tttccatcca tcatcttcaa ttcgtaacta tgaatatgta 3120 tggcacacac atacagatcc aaaattaata aatccaccag gtagtttgaa acagaattct 3180 actccgatct agaacgaccg cccaaccaga ccacatcatc acaaccaaga caaaaaaaag 3240

catgaaaaga tgacccgaca aacaagtgca cggcatatat tgaaataaag gaaaagggca 3300 aaccaaaccc tatgcaacga aacaaaaaa atcatgaaat cgatcccgtc tgcggaacgg 3360 ctagagccat cccaggattc cccaaagaga aacactggca agttagcaat cagaacgtgt 3420 ctgacgtaca ggtcgcatcc gtgtacgaac gctagcagca cggatctaac acaaacacgg 3480 atctaacaca aacatgaaca gaagtagaac taccgggccc taaccatgga ccggaacgcc 3540 gatctagaga aggtagagag ggggggggg ggaggacgag cggcgtacct tgaagcggag 3600 gtgccgacgg gtggatttgg gggagatctg gttgtgtgt tgtgcgctcc gaacaacacg 3660 aggttgggga aagagggtgt ggaggggtg tctatttatt acggcgggcg aggaagggaa 3720 agcgaaggag cggtgggaaa ggaatccccc gtagctgccg tgccgtgaga ggaggaggag 3780 10 geogeotgee gtgeoggete acgtetgeeg etcegecacg caatttetgg atgeogacag 3840 cggagcaagt ccaacggtgg agcggaactc tcgagagggg tccagaggca gcgacagaga 3900 tgccgtgccg tctgcttcgc ttggcccgac gcgacgctgc tggttcgctg gttggtgtcc 3960 gttagactcg tcgacggcgt ttaacaggct ggcattatct actcgaaaca agaaaaatgt 4020 ttccttagtt tttttaattt cttaaagggt atttgtttaa tttttagtca ctttatttta 4080 ttctatttta tatctaaatt attaaataaa aaaactaaaa tagagtttta gttttcttaa 15 4140 tttagaggct aaaatagaat aaaatagatg tactaaaaaa attagtctat aaaaaccatt 4200 aaccctaaac cctaaatgga tgtactaata aaatggatga agtattatat aggtgaagct 4260 atttgcaaaa aaaaaggaga acacatgcac actaaaaaga taaaactgta gagtcctgtt 4320 gtcaaaatac tcaattgtcc tttagaccat gtctaactgt tcatttatat gattctctaa 4380 20 aacactgata ttattgtagt actatagatt atattattcg tagagtaaag tttaaatata 4440 tgtataaaga tagataaact gcacttcaaa caagtgtgac aaaaaaaata tgtggtaatt 4500 ttttataact tagacatgca atgctcatta tctctagaga ggggcacgac cgggtcacgc 4560 tgcactgcag gaattcgatg ggctcgaggt accgagctcg gtacccactg gattttggtt 4620 ttaggaatta gaaattttat tgatagaagt attttacaaa tacaaataca tactaagggt 4680 25 ttcttatatg ctcaacacat gagcgaaacc ctataagaac cctaattccc ttatctggga 4740 actactcaca cattattata gagagagata gatttgtaga gagagactgg tgatttcagc 4800 ggcatgcctg caggtcgact cagatctggg taactggcct aactggcctt ggaggagctg 4860 gcaactcaaa atccctttgc caaaaaccaa catcatgcca tccaccatgc ttgtatccag 4920 ctgcgcgcaa tgtaccccgg gctgtgtatc ccaaagcctc atgcaaccta acagatggat 4980 30 cgtttggaag gcctataaca gcaaccacag acttaaaacc ttgcgcctcc atagacttaa 5040 gcaaatgtgt gtacaatgtg gatcctaggc ccaacctttg atgcctatgt gacacgtaaa 5100 cagtactete aactgtecaa tegtaagegt teetageett eeagggeeca gegtaageaa 5160 taccagccac aacaccctca acctcagcaa ccaaccaagg gtatctatct tgcaacctct 5220 ctagatcatc aatccactct tgtggtgttt gtggctctgt cctaaagttc actgtagacg 5280 35 tctcaatgta atggttaacg atatcacaaa ccgcggccat atcagctgct gtagctggcc 5340 taateteaac tggteteete teeggagaea tgtegaetet agaggateee eegggetgea 5400 gaagtaacac caaacaacag ggtgagcatc gacaaaagaa acagtaccaa gcaaataaat 5460 agcgtatgaa ggcagggcta aaaaaatcca catatagctg ctgcatatgc catcatccaa 5520 gtatatcaag atcaaaataa ttataaaaca tacttgttta ttataataga taggtactca 5580 40 aggttagagc atatgaatag atgctgcata tgccatcatg tatatgcatc agtaaaaccc 5640 acatcaacat gtatacctat cctagatcga tatttccatc catcttaaac tcgtaactat 5700 gaagatgtat gacacacac tacagttcca aaattaataa atacaccagg tagtttgaaa 5760 cagtattcta ctccgatcta gaacgaatga acgaccgccc aaccacacca catcatcaca 5820 accaagcgaa caaaaagcat ctctgtatat gcatcagtaa aacccgcatc aacatgtata 5880 45 cctatcctag atcgatattt ccatccatca tcttcaattc gtaactatga atatgtatgg 5940 cacacacata cagatccaaa attaataaat ccaccaggta gtttgaaaca gaattctact 6000 ccgatctaga acgaccgccc aaccagacca catcatcaca accaagacaa aaaaaagcat 6060 gaaaagatga cccgacaaac aagtgcacgg catatattga aataaaggaa aagggcaaac 6120 caaaccctat gcaacgaaac aaaaaaaatc atgaaatcga tcccgtctgc ggaacggcta 6180

	•						
	gagccatecc	aggattcccc	aaagagaaac	actggcaagt	tagcaatcag	aacgtgtctg	6240
			tacgaacgct				6300
			gtagaactac				6360
			gggggggga				6420
5			agatctggtt				6480
			gggggtgtct				6540
			atcccccgta				6600
			tctgccgctc				6660
			ggaactctcg				6720
10			gcccgacgcg				6780
			acaggctggc				6840
			aaagggtatt				6900
			aaataaaaaa				6960
			atagatgtac				7020
15			actaataaaa				7080
			catgcacact				7140
			agaccatgte				7200
			atagattata				7260
			cttcaaacaa				7320
20			ctcattatct				7320
			agctggctga				7440
			gtcccgcgtc				. 7500
			ttgtcgtttc				7560
			aattgtcatt				7620
25			tatcaaacgg				7680
			aagcgtcaat				7740
			ccggcagctc				7800
			agcttgcgtc				7860
			gggaacgcat				7920
30			tcgcaaccca				7980
			ccgatcccca				8040
			ttgtcggcat				8100
			tcgtagtgat				8160
			ccgacttcgt				8220
35			tggtggagct				8280
			tegtgtegeg				8340
			ggtacgaget				8400
			ccgccgccgg				8460
			aggcgctggc				8520
40			gagcaaaagc				8580
			aacgttggcc				8640
			ggaggatcac				8700
			gctatctgaa				8760
			gaattttagc				8820
45			tggaatgccc				8880
			gccggccctg				8940
			accatccggc				9000
			ggccgcgcag				9060
			caaggggccg				9120
					3		2120

cgccggcagc cggtgcgccg tcgattagga agccgcccaa gggcgacgag caaccagatt 9180 ttttcgttcc gatgctctat gacgtgggca cccgcgatag tcgcagcatc atggacgtgg 9240 ccgttttccg tctgtcgaag cgtgaccgac gagctggcga ggtgatccgc tacgagcttc 9300 cagacgggca cgtagaggtt tccgcagggc cggccggcat ggccagtgtg tgggattacg 9360 5 acctggtact gatggcggtt tcccatctaa ccgaatccat gaaccgatac cgggaaggga 9420 agggagacaa geceggeege gtgtteegte cacaegttge ggaegtaete aagttetgee 9480 ggcgagccga tggcggaaag cagaaagacg acctggtaga aacctgcatt cggttaaaca 9540 ccacgcacgt tgccatgcag cgtacgaaga aggccaagaa cggccgcctg gtgacggtat 9600 ccgagggtga agccttgatt agccgctaca agatcgtaaa gagcgaaacc gggcggccgg 9660 10 agtacatcga gatcgagcta gctgattgga tgtaccgcga gatcacagaa ggcaagaacc 9720 eggaegtget gaeggtteae eeegattaet ttttgatega teeeggeate ggeegtttte 9780 tctaccgcct ggcacgccgc gccgcaggca aggcagaagc cagatggttg ttcaagacga 9840 tctacgaacg cagtggcagc gccggagagt tcaagaagtt ctgtttcacc gtgcgcaagc 9900 tgatcgggtc aaatgacctg ccggagtacg atttgaagga ggaggcgggg caggctggcc 9960 15 cgatcctagt catgcgctac cgcaacctga tcgagggcga agcatccgcc ggttcctaat 10020 gtacggagca gatgctaggg caaattgccc tagcagggga aaaaggtcga aaaggtctct 10080 ttcctgtgga tagcacgtac attgggaacc caaagccgta cattgggaac cggaacccgt 10140 acattgggaa cccaaagccg tacattggga accggtcaca catgtaagtg actgatataa 10200 aagagaaaaa aggcgatttt tccgcctaaa actctttaaa acttattaaa actcttaaaa 10260 20 cccgcctggc ctgtgcataa ctgtctggcc agcgcacagc cgaagagctg caaaaagcgc 10320 ctaccetteg gtegetgege tecetaegee eegeegette gegteggeet ategeggeet 10380 atgcggtgtg aaataccgca cagatgcgta aggagaaaat accgcatcag gcgctcttcc 10440 getteetege teactgacte getgegeteg gtegttegge tgeggegage ggtateaget 10500 cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg aaagaacatg 10560 25 tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc 10620 cataggetee geceeetga egageateae aaaaategae geteaagtea gaggtggega 10680 aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct cgtgcgctct 10740 cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc gggaagcgtg 10800 gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag 10860 30 ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc cggtaactat 10920 cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc cactggtaac 10980 aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg gtggcctaac 11040 tacggctaca ctagaaggac agtatttggt atctgcgctc tgctgaagcc agttaccttc 11100 ggaaaaagag ttggtagete ttgateegge aaacaaacea eegetggtag eggtggtttt 11160 35 tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc 11220 ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat tttggtcatg 11280 catgatatat ctcccaattt gtgtagggct tattatgcac gcttaaaaat aataaaagca 11340 gacttgacct gatagtttgg ctgtgagcaa ttatgtgctt agtgcatcta acgcttgagt 11400 taagccgcgc cgcgaagcgg cgtcggcttg aacgaatttc tagctagaca ttatttgccg 11460 40 actacettgg tgatetegee ttteaegtag tggacaaatt etteeaactg atetgegege 11520 gaggccaage gatettette ttgtecaaga taageetgte tagetteaag tatgaeggge 11580 tgatactggg ccggcaggcg ctccattgcc cagtcggcag cgacatcctt cggcgcgatt 11640 ttgccggtta ctgcgctgta ccaaatgcgg gacaacgtaa gcactacatt tcgctcatcg 11700 ccagcccagt cgggcggcga gttccatagc gttaaggttt catttagcgc ctcaaataga 11760 45 tcctgttcag gaaccggatc aaagagttcc tccgccgctg gacctaccaa ggcaacgcta 11820 tgttctcttg cttttgtcag caagatagcc agatcaatgt cgatcgtggc tggctcgaag 11880 atacctgcaa gaatgtcatt gcgctgccat tctccaaatt gcagttcgcg cttagctgga 11940 taacgccacg gaatgatgtc gtcgtgcaca acaatggtga cttctacagc gcggagaatc 12000 togotototo caggggaago ogaagtttoo aaaaggtogt tgatcaaago togoogogtt 12060

WO 2005/014827 PCT/EP2004/007567

	gtttcatcaa	gccttacggt	caccgtaacc	agcaaatcaa	tatcactgtg	tggcttcagg	12120
	ccgccatcca	ctgcggagcc	gtacaaatgt	acggccagca	acgtcggttc	gagatggcgc	12180
	tcgatgacgc	caactacctc	tgatagttga	gtcgatactt	cggcgatcac	cgcttccccc	12240
	atgatgttta	actttgtttt	agggcgactg	ccctgctgcg	taacatcgtt	gctgctccat	12300
5	aacatcaaac	atcgacccac	ggcgtaacgc	gcttgctgct	tggatgcccg	aggcatagac	12360
	tgtaccccaa	aaaaacagtc	ataacaagcc	atgaaaaccg	ccactgcgtt	ccatg	12415